Size-Resolved Phase Function Monitor, Phase I

Completed Technology Project (2018 - 2019)

Project Introduction

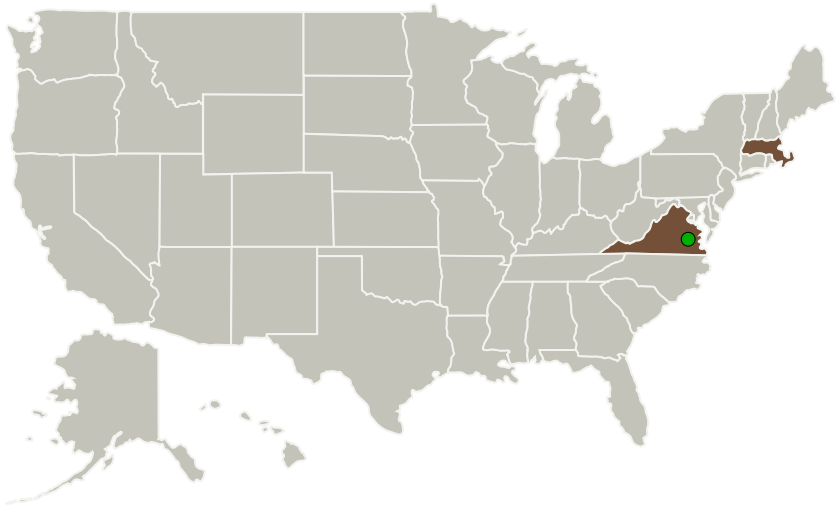
In this Phase I study, a unique aerosol phase function monitor will be developed. It will utilize an aerodynamic lens to collimate and separate poly-dispersed aerosols based on their differences in vacuum aerodynamic diameters. It will be capable of measuring aerosol scattering intensity at multiple angles simultaneously with respect to the incident laser beam after a period of particle time of flight, which is dependent on aerosol vacuum aerodynamic diameter. Thus the proposed technique is capable of determining size-resolved scattering phase function as well as asymmetry factor of atmospheric aerosols from 100nm to 1000nm in real-time.

Anticipated Benefits

The proposed instrument will allow real-time measurements of size-resolved scattering phase function and asymmetry factor of atmospheric aerosols from 100nm to 1000nm for NASA's Airborne Measurement Program. A field-deployable prototype will be a deliverable at the end of the Phase II study.

1. Characterization of synthetic metallic and semiconductor nanoparticles from various generation sources
2. Monitoring local air quality for environmental investigations

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Aerodyne Research, Inc

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Continued on following page.

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Organizations Performing Work	Role	Type	Location
Aerodyne Research, Inc	Lead Organization	Industry	Billerica, Massachusetts
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Massachusetts	Virginia

Project Transitions

July 2018: Project Start

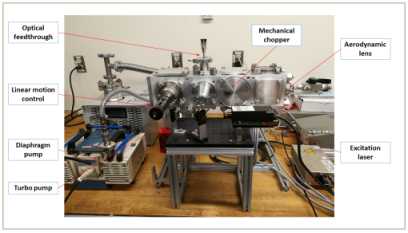
February 2019: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/141297)*

Images

Briefing Chart Image
Size-Resolved Phase Function Monitor, Phase I
(https://techport.nasa.gov/image/127573)



Final Summary Chart Image
Size-Resolved Phase Function Monitor, Phase I
(https://techport.nasa.gov/image/132925)

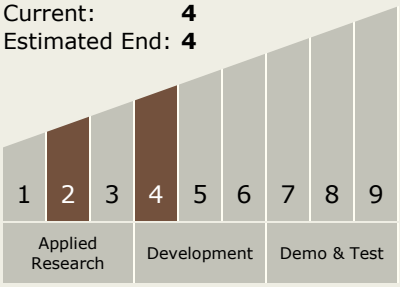
Project Management *(cont.)*

Program Manager:
Carlos Torrez

Principal Investigator:
Zhenhong Yu

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destination

Earth